

FIG. 1

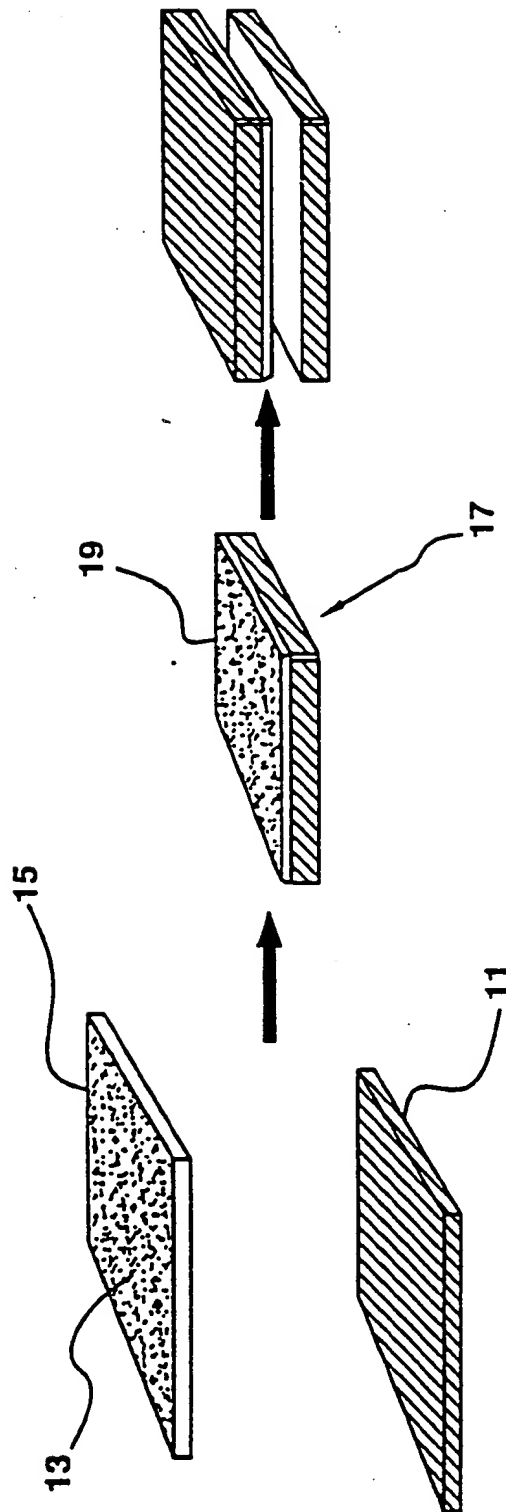


FIG.2A

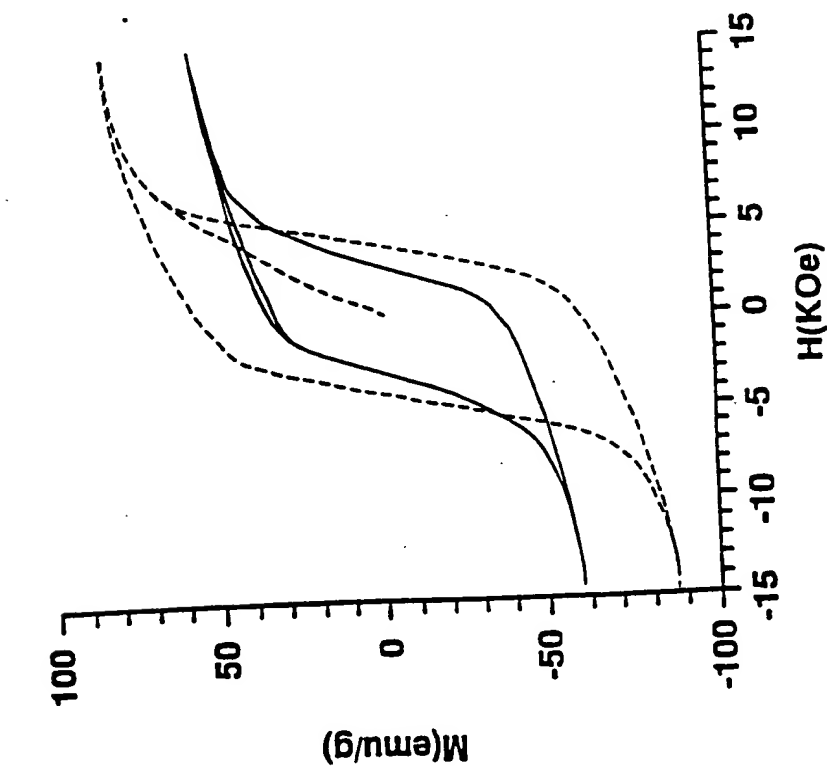


FIG. 2B

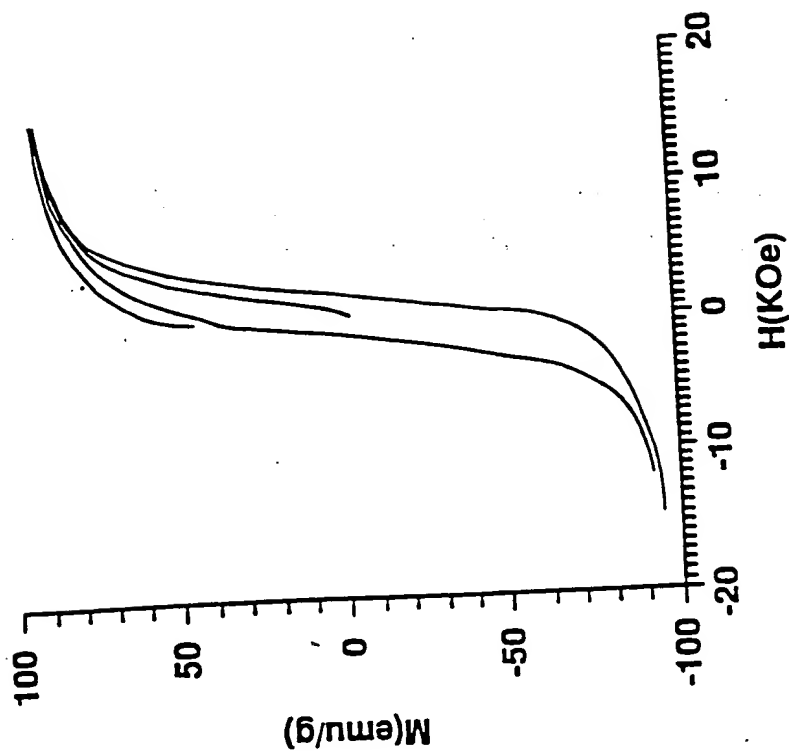


FIG. 3

Smart Susceptor Test Results

Material	Type	Geometry	Curie Temp °C	Heating Results	
				275 kHz	4MHz
Co ₂ Ba ₂ Fe ₁₂ O ₂₂	ferromagnetic	powder	345	60 - 65°C	340 - 370°C
Fe ₃ O ₄ (44 micron)	ferromagnetic	powder	585	350°C	600°C
Fe ₃ O ₄ (840 micron)	ferromagnetic	powder	585	470°C	not tested
SrFe ₁₂ O ₁₉ #1	ferromagnetic	powder	450	60°C	not tested
SrFe ₁₂ O ₁₉ #2	ferromagnetic	powder	450	88°C	not tested

FIG. 4A

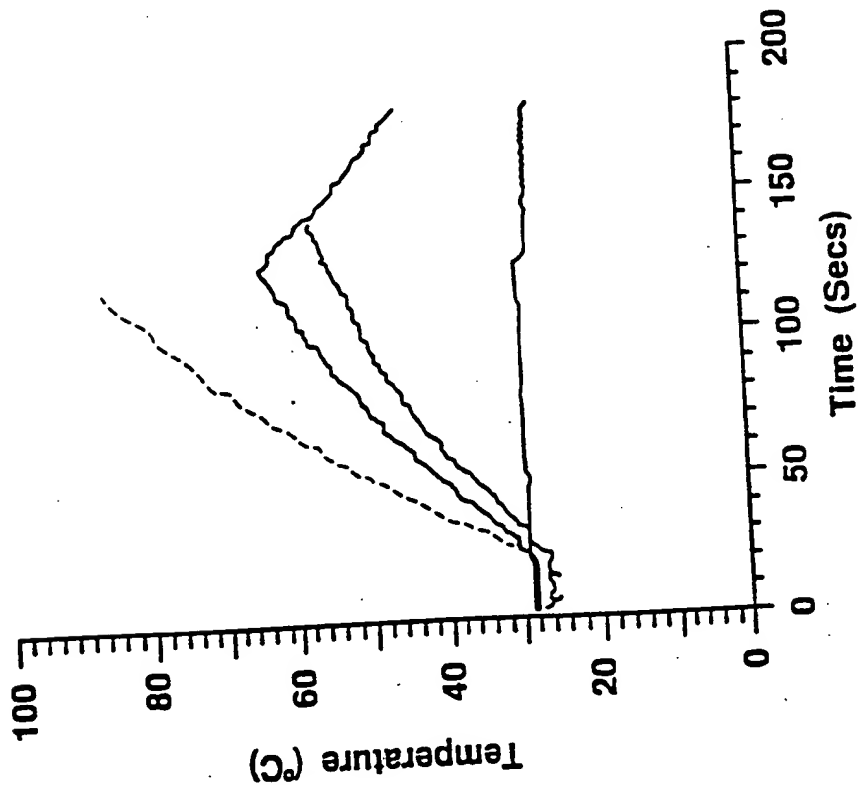


FIG. 4B

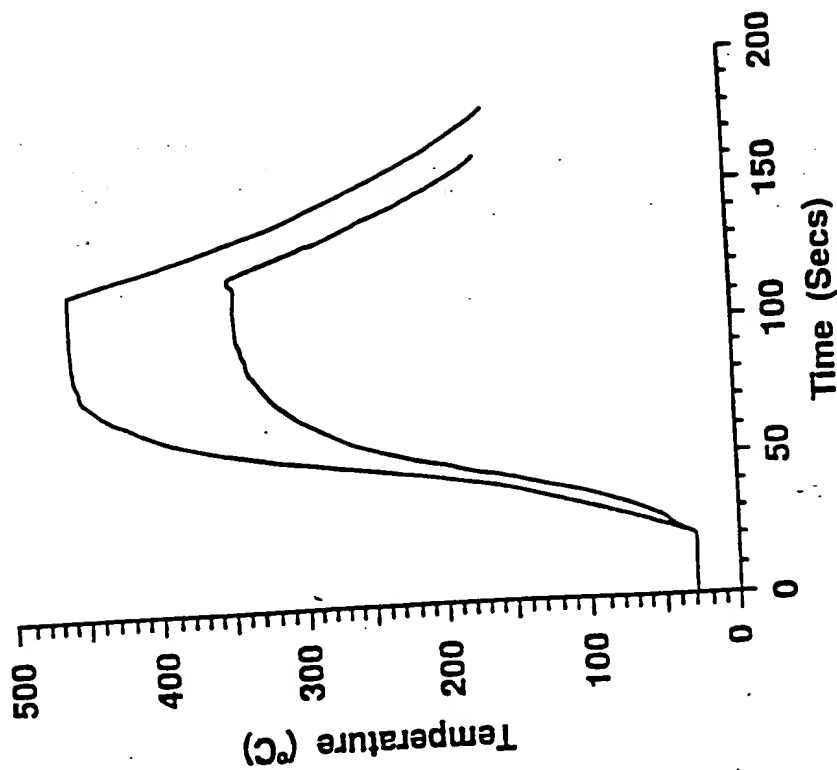


FIG. 5

Smart Susceptor Test Results for Filled Films

Material	Geometry	Thickness (mils)	Curie Temp °C	Heating Results		
				275 kHz	4 MHz	6.5 MHz
SrF ₁₂ O ₁₉ #1	30 % filled PSF film	4.0	450			149 °C
SrFe ₁₂ O ₁₉ #2 (1-2 micron)	30 % filled PSF film	4.0	450			343 °C
SrFe ₁₂ O ₁₉ #2 (1-2 micron)	30 % filled PSF film	10.0	450			371 °C
SrFe ₁₂ O ₁₉ #2	30 % filled PSF film	8.0	450			360 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂	30 % filled PSF film	4.0	345		109 °C	
Co ₂ Ba ₂ Fe ₁₂ O ₂₂	30 % filled PSF film	8.0	345			249 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂ (<1 micron)	30 % filled PSF film	4.0	345			243-249 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂ (<1 micron)	30 % filled PSF film	8.0	345			288-302 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂ (<1 micron)	30 % filled PSF film	10.0	345			288-302 °C
Fe ₃ O ₄ (840 micron)	30 % filled PSF film	4.0	585	50 °C		
Fe ₃ O ₄ (44 micron)	10 % filled PSF film	4.0	585	38 °C		>371 °C
Fe ₃ O ₄ (44 micron)	30 % filled PSF film	4.0	585	210 °C		

Ferrite Susceptor/Polymer Matrix

Susceptor (T curie)		SrF (450C)	Co-2Y (340C)	Mg-2Y (260-280)	Zn/Co-2Y (255C)	Zn/Mg-2Y (175C)	Soft Ferr (120-350)
Polymer	Working Temp (note 1)				Note 3	Note 3	Note 4
PEEK	360C	X	X				
PEKK		X	X				
PEI	340C	X	X				
PPS	340C	X	X				
PSU	340C	X	X				
PET	280-300		X				X
Polyester	280-300		X				
MXD6	270-280						X
PA	220C			X			X
PP	200-210			X	X	X	X
PP/MXD6	200-210			X	X	X	X
PP/EVOH	200-210			X	X	X	X
PE	190-200			X		X	X

Notes:

- (1) "Working Temp" of Polymer is approx. 30C above melting temp.
- (2) Curie Temps of Zn/Mg and Zn/Co blends vary by concentration of Zn
- (3) Curie Temps of soft ferrite vary by choice of ferrite.

FIG. 6

Process Variables

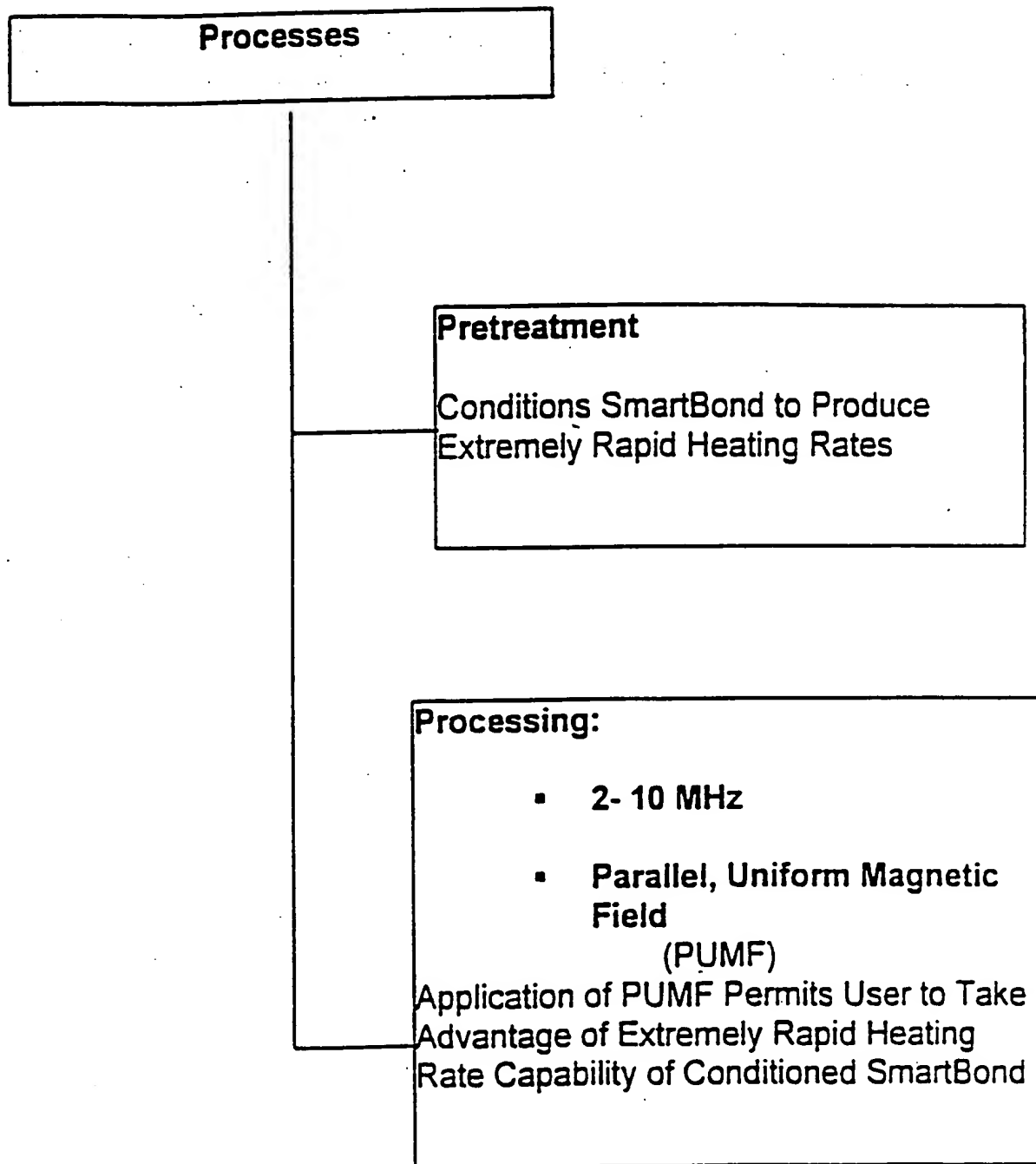


FIG. 7

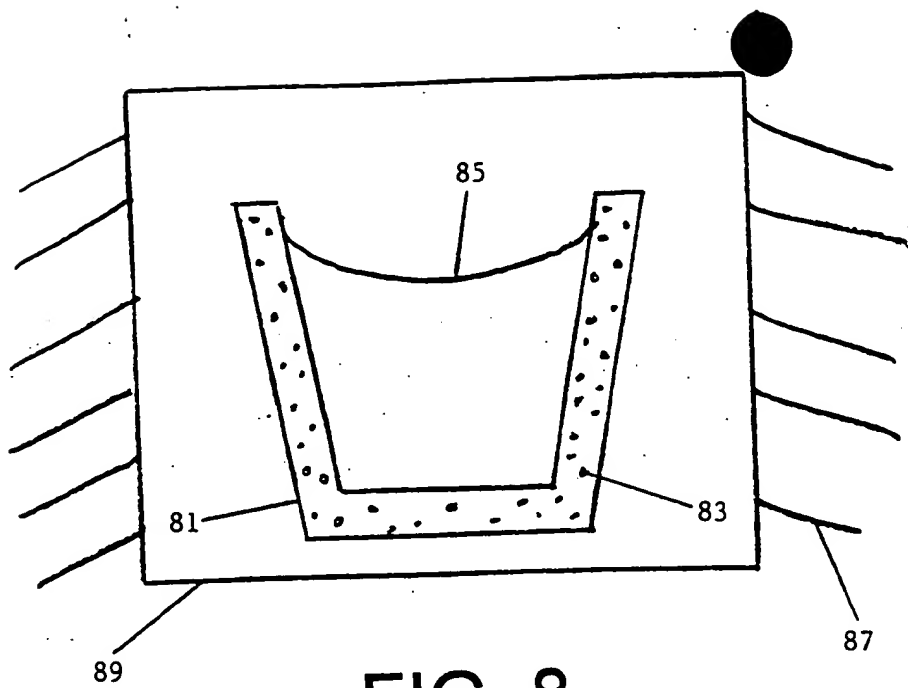


FIG. 8

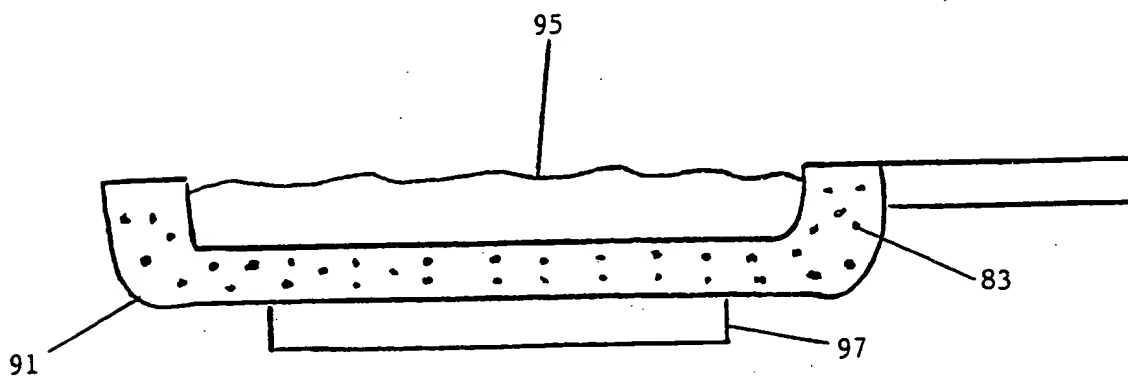


FIG. 9

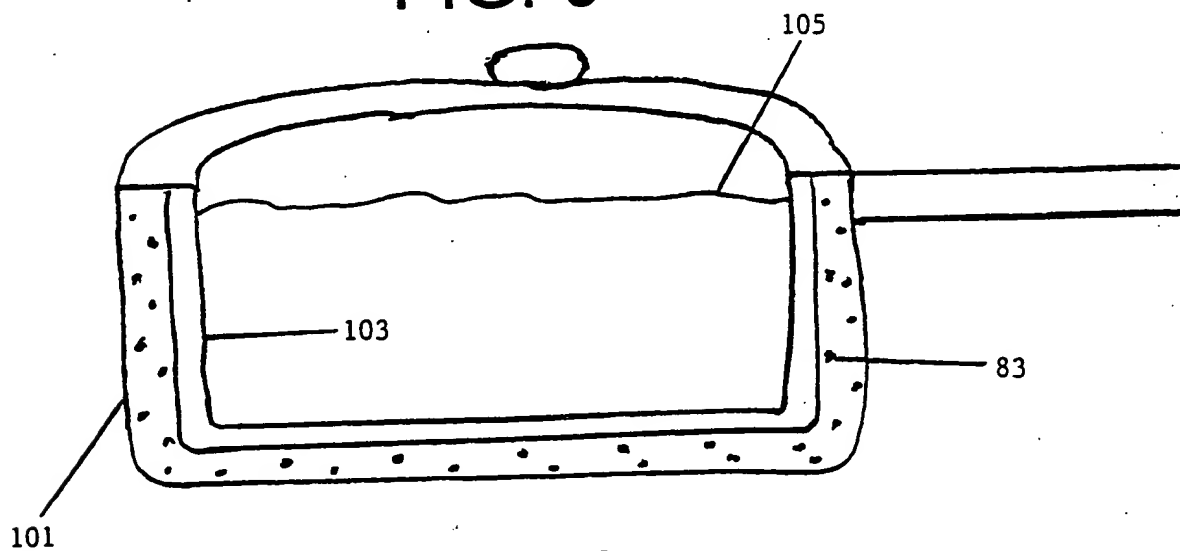
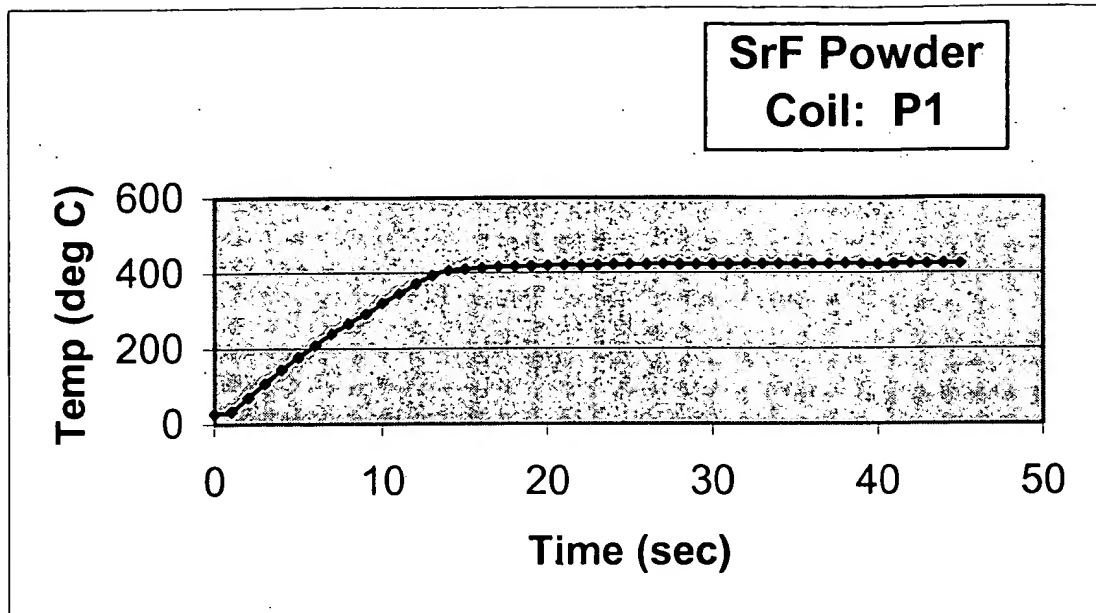
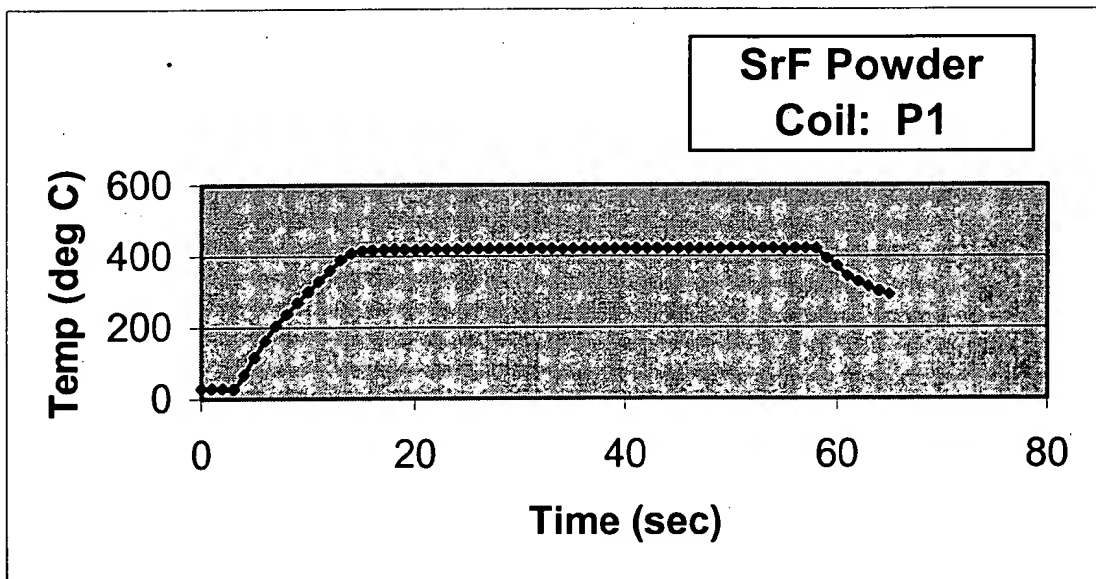


FIG. 10



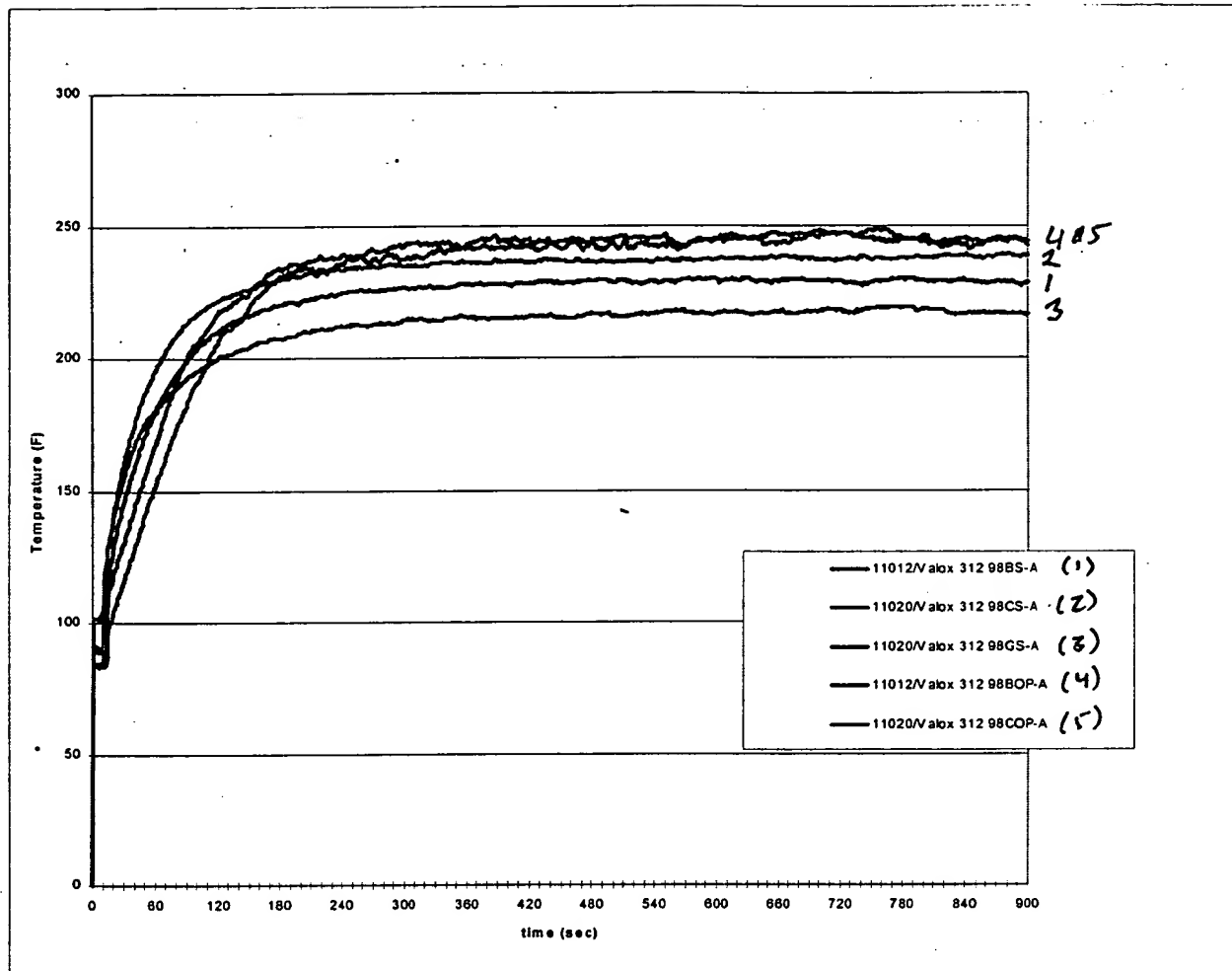
(a)



(b)

Figure 11

Figure 12.



Power (2.5 kW), Frequency (3.4 MHz)
Coil S1L (15 Turns)

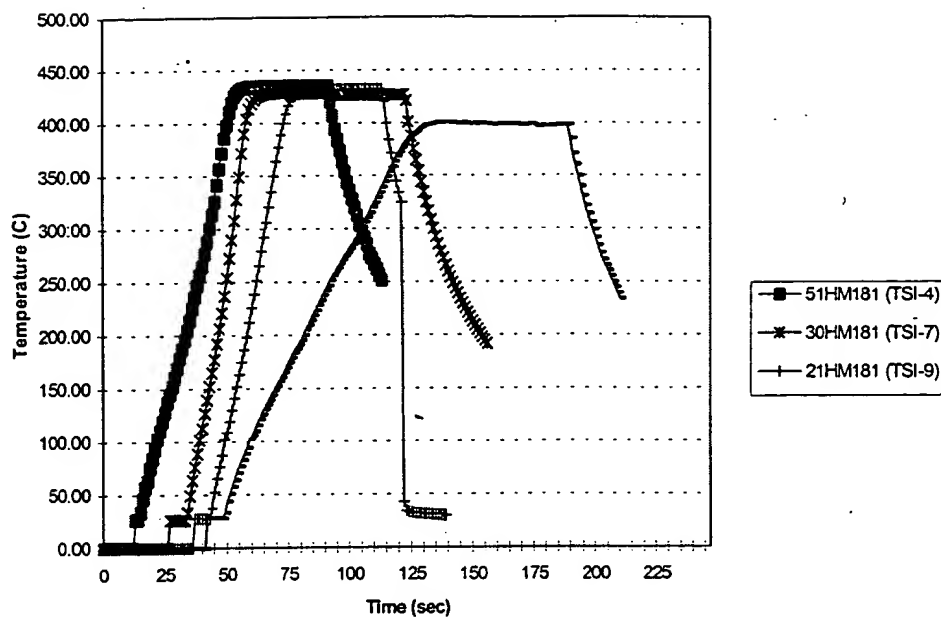


Figure 13

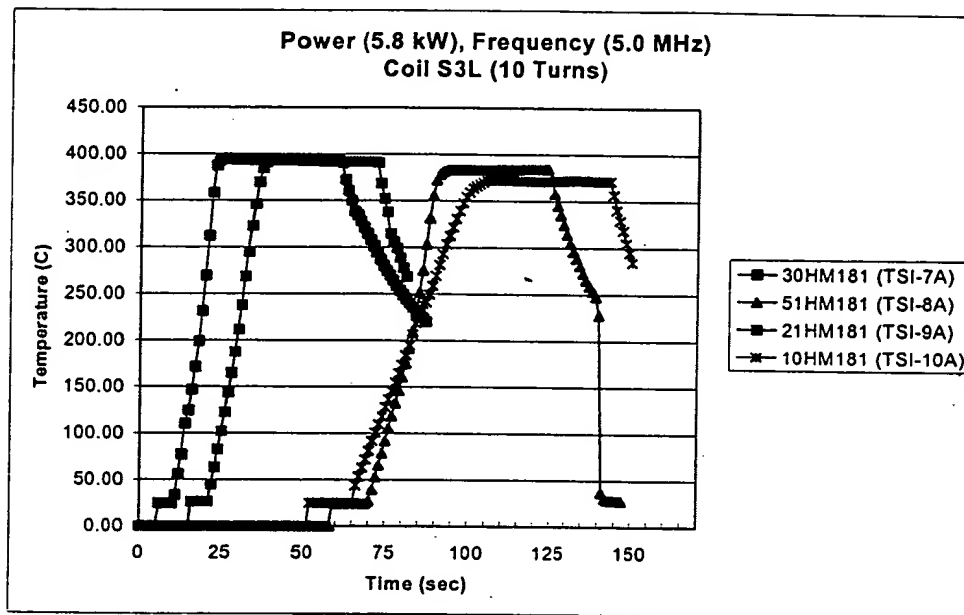


Figure 14

(a)



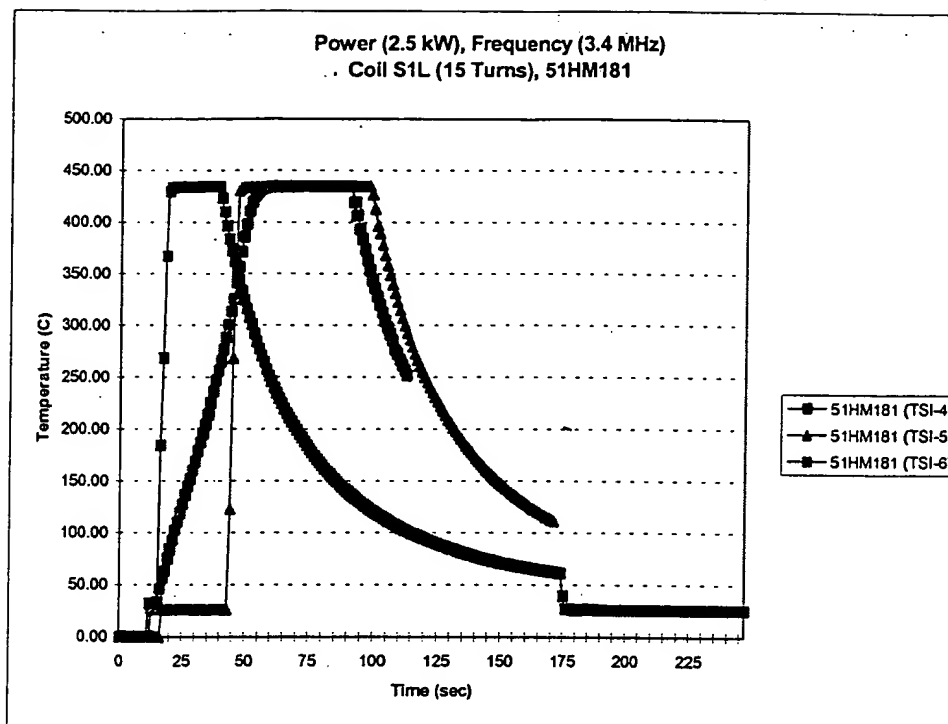


Figure 16

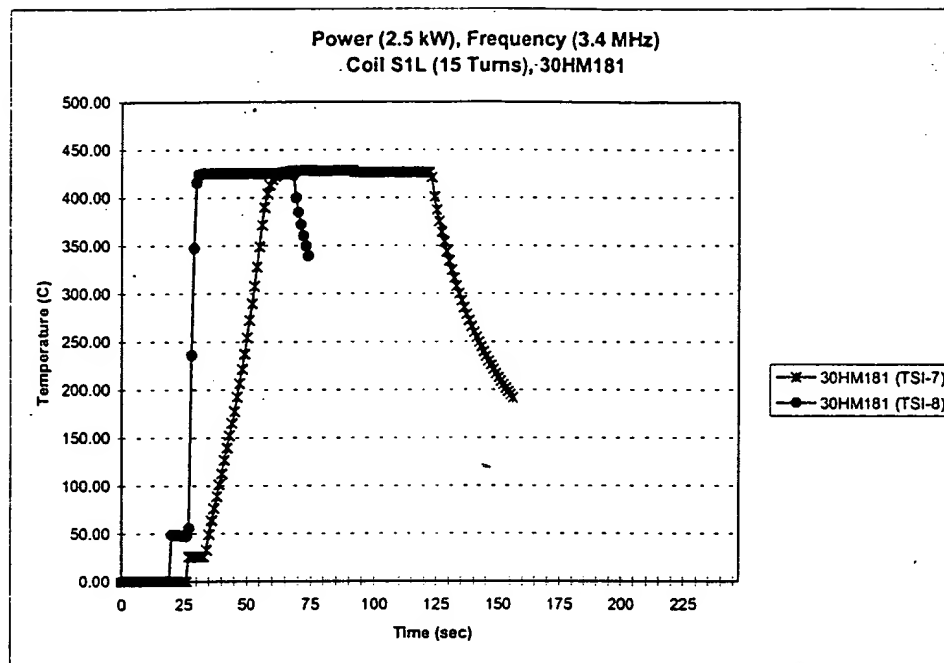


Figure 17

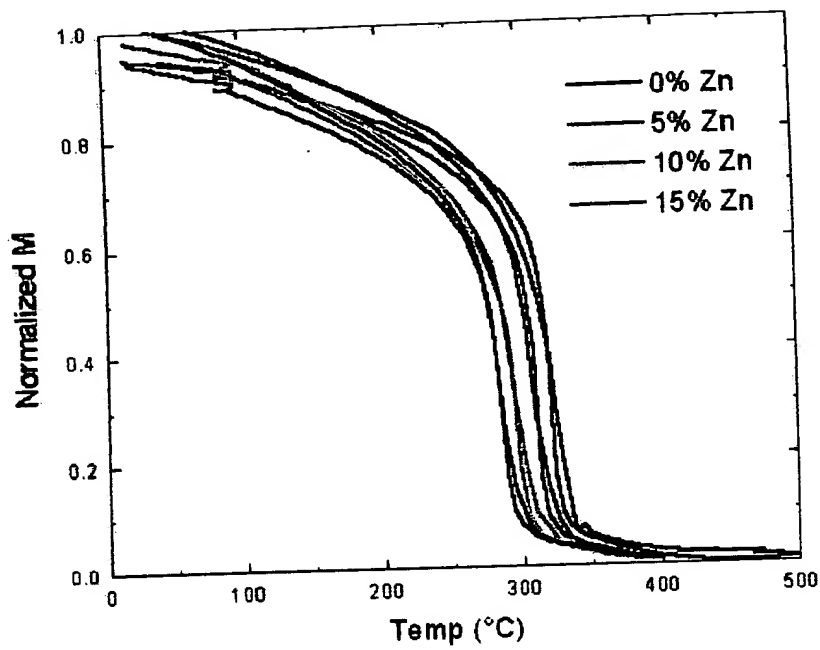


FIGURE 18

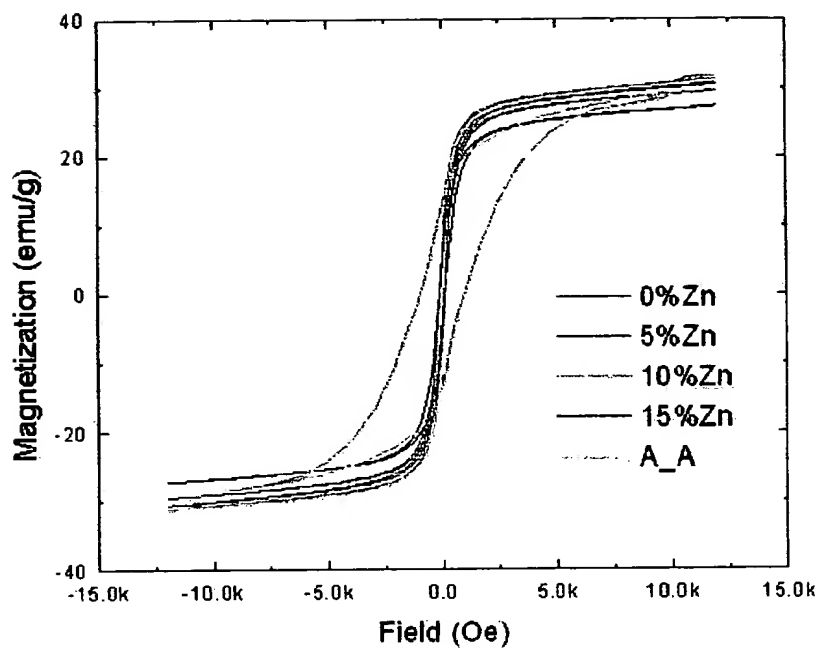
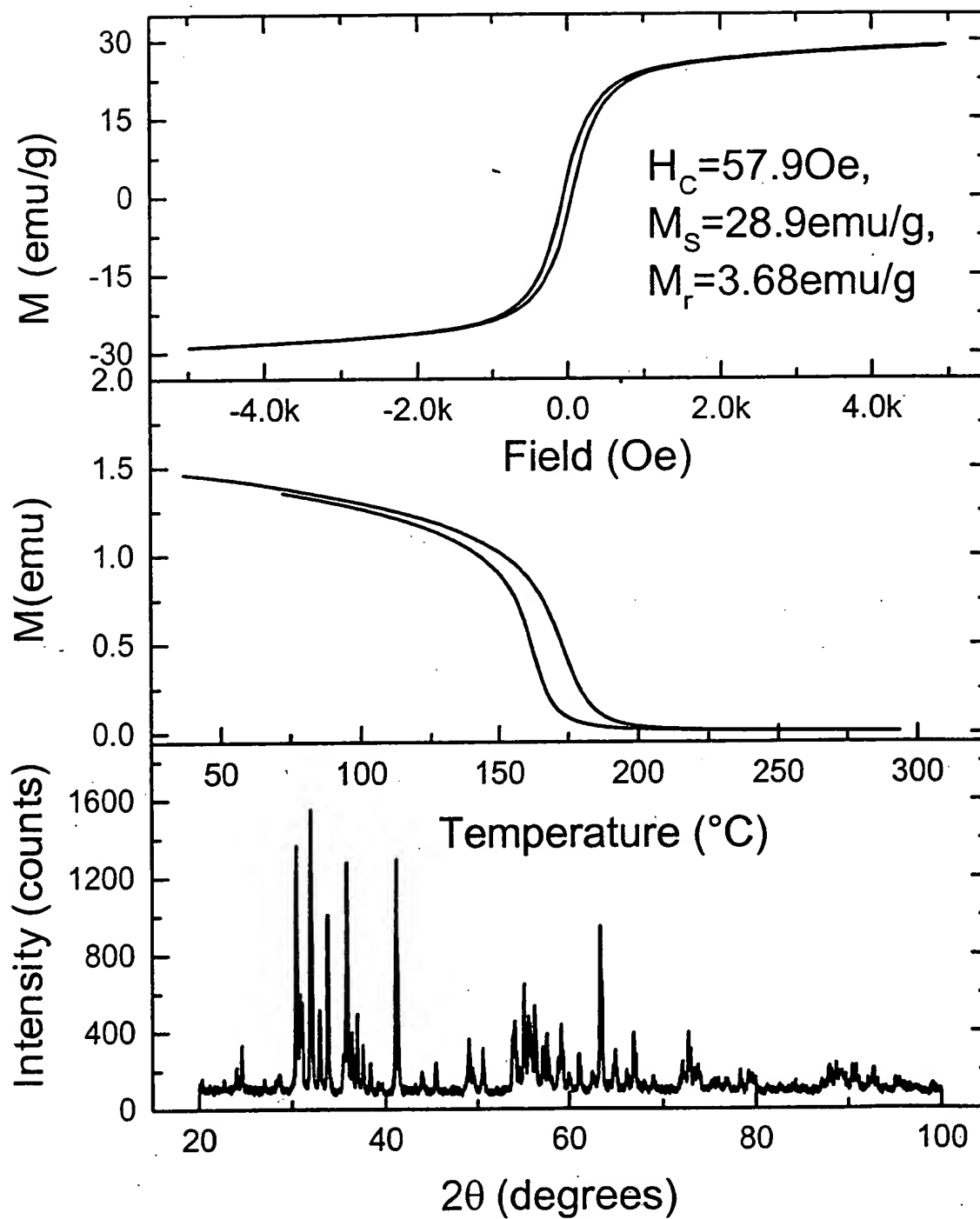


FIGURE 19

Figure 20

Zn/Mg-2Y



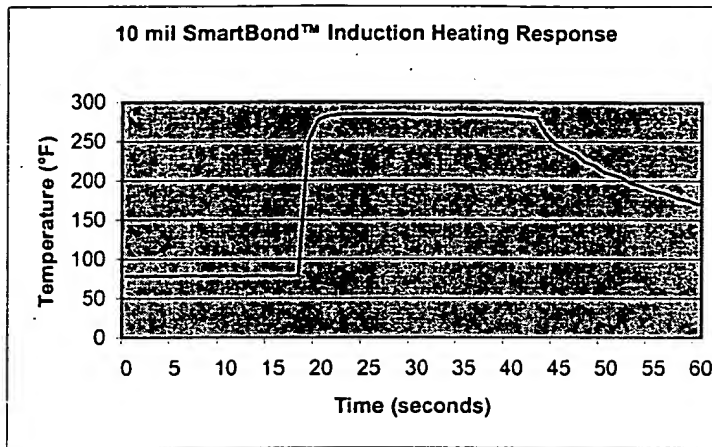


Figure 21